**UNITED STATES DEPARTMENT OF COMMERCE**
**National Telecommunications and Information Administration**
Washington, D.C. 20230



MAY - 4 2010

WT Dkt. No. 07-293

Mr. Julius Knapp
Chief
Office of Engineering and Technology
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Dear Mr. Knapp:

In response to the Federal Communications Commission (FCC) Public Notice, the National Telecommunications and Information Administration (NTIA) submits the following comments to address the emission suppression limits for Wireless Communication Service (WCS) base and mobile/portable stations operating in the 2305-2320 MHz and 2345-2360 MHz bands.[1]

As you are aware, Federal and non-Federal facilities throughout the United States use the 2360-2390 MHz band for aeronautical mobile telemetry (AMT) systems that support flight testing operations. The AMT performs functions in the 2360-2390 MHz band critical to both the Federal Government and the commercial aviation industry. Because the spectrum allocated for the Digital Audio Radio Satellite Service and WCS was reallocated from telemetry spectrum, the FCC must ensure that the remaining portion continues to be free of harmful interference for AMT. In addition to the potential interference to AMT systems, NTIA is concerned about potential interference to the National Aeronautics and Space Administration (NASA) Goldstone California Deep Space Network (DSN) receiving earth station in the 2290-2300 MHz band.[2] The FCC's Rules for WCS currently protect both of these operations in a manner which prevents the practical deployment of a ubiquitous mobile service in the WCS band. The FCC's consideration of new rules that would facilitate mobile deployment makes critical the need to get right the interference rules for WCS.

The FCC National Broadband Plan recommends that the FCC make 20 MHz available for mobile broadband use in the WCS band, while protecting neighboring Federal and non-Federal AMT and satellite radio operations.[3] NTIA understands the importance of making spectrum available in the near-term for the development of wireless broadband systems. To this

1. Federal Communications Commission Public Notice, *Commission Staff Requests that Interested Parties Supplement the Record on Draft Interference Rules for Wireless Communications Service and Satellite Digital Audio Radio Service*, DA 10-592 (Rel. Apr. 2, 2010).

2. This band is used for telemetry data from probes outside of the Earth's orbit. To give some idea of Deep Space Network sensitivity, the antennas are able to capture information that is more than 20 billion times weaker than the power level at which a digital watch functions.

3. Federal Communications Commission, *Connecting America: The National Broadband Plan* ("FCC NBP") (Mar. 16, 2010) Chapter 5 at 85.

end, NTIA has worked closely with Federal and non-Federal AMT operators, as well as representatives from the WCS community, to ensure that, as this spectrum becomes available, AMT operations continue to be protected. The loss of flight test data due to interference not only requires costly re-flights to clear a set of test points, but puts flight safety at risk. The Department of Defense and the Federal Aviation Administration have expressed concerns about the protection of AMT receivers as the FCC considers rule changes in the WCS band.[4] The emission suppression limits of existing base and mobile/portable equipment available in the WCS band cannot achieve the levels necessary to protect AMT receivers from uncoordinated WCS operations unless a guard band on the order of 10 MHz is established.[5] Although necessary to protect AMT receivers from interference, establishing a guard band would result in a large portion of the WCS spectrum being unavailable for use. While the National Broadband Plan recommended that the FCC make 20 MHz, out of a possible 30 MHz, of the WCS spectrum available for mobile broadband, NTIA proposes a solution that would allow more than the recommended 20 MHz to be available in a majority of the country.[6] This solution combines a set of realistic suppression limits for WCS with coordination requirements.

NTIA recommends that the Commission adopt the following emission suppression limits in the 2360-2390 MHz band for WCS base and mobile/portable stations as providing a measure of interference protection while being available in currently technology:

**Base Station**: the power of any emission shall be suppressed by a factor of not less than:
43 + 10 Log (P) in the 2360-2362.5 MHz band segment
55 + 10 Log (P) in the 2362.5-2365 MHz band segment
70 + 10 Log (P) in the 2365-2367.5 MHz band segment
72 + 10 Log (P) in the 2367.5-2370 MHz band segment
75 + 10 Log (P) above 2370 MHz

**Mobile/Portable Station:** the power of any emission shall be suppressed by a factor of not less than:
43 + 10 Log (P) in the 2360-2365 MHz band segment
70 + 10 Log (P) above 2365 MHz

P is average power in Watts measured at the output of the transmitter.[7] The emission suppression levels are measured in a 1 MHz resolution bandwidth.

---

4. *See* Enclosure 1 Letter from Richard L. Day, Senior Vice President for Operations, Federal Aviation Administration to Lawrence E. Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration (Dec. 16, 2009); and Enclosure 2 Letter from Cheryl J. Roby, Acting Deputy Assistant Secretary of Defense for Networks and Information Integration Office of Assistant Secretary of Defense, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration (Feb. 4, 2010).

5. A guard band is an unused part of the radio spectrum between bands which is utilized to prevent interference.

6. FCC NBP Chapter 5 at 85.

7. The averaging is performed only during periods of transmission.

Since Federal and non-Federal AMT receivers operate at fixed locations, the FCC can establish a coordination process for WCS base stations.[8] NTIA recommends that, as the FCC Public Notice proposes, the Commission establish a coordination distance of 45 kilometers or radio line-of-sight from the AMT receiver site, whichever is the larger distance. The Aerospace and Flight Test Radio Coordinating Council (AFTRCC) will provide a listing of current and planned Federal and non-Federal AMT receiver sites.[9] While NTIA recommends a 45 kilometer or line-of-sight distance to minimize the need for coordination there are instances where interference to AMT receivers beyond this distance could occur. NTIA requests that the Commission require the WCS licensee to take all practicable steps to eliminate these interference situations even when they are beyond the 45 kilometer distance.

The Commission should require that all WCS base stations within the 45 kilometers be coordinated with AFTRCC prior to operation. To minimize the need for coordination the WCS licensees operating in the 2345-2360 MHz band should avoid locating base stations within radio line of sight of AMT receiver sites. If during the coordination process a mutual agreement as to the protection of AMT receivers cannot be reached, NTIA and the FCC will be notified to take such action as may be necessary to ensure that a mutually acceptable arrangement is reached. This may include dealing with cases of interference that occur to AMT receivers from WCS base stations operating outside of the 45 kilometer coordination distance.

During the coordination process, the WCS operators should consider the following factors to reduce interference to AMT receivers: using the channels in the lower portion of the WCS band (2305-2320 MHz) for base stations located in areas with lower population densities; using lower antenna heights to minimize base station coverage; using down tilt antennas for base stations to minimize the signal level in the direction of AMT sites; employing sector blanking to eliminate base station coverage in the direction of AMT sites; reducing the transmitter power to minimize the base station coverage areas; and employing terrain shielding where practical to reduce signal levels in the direction of AMT sites.[10] Factors that should be considered as part of the coordination process should also include the actual operating parameters of the AMT receiver (e.g., antenna height) and operational area used for flight testing (e.g., test ranges located away from populated areas or over the ocean). Future technology advances, including better filtering for WCS base stations, should also be considered to facilitate coordination.

To protect the NASA DSN receiving earth station, NTIA recommends that the Commission adopt following emission suppression limits below 2305 MHz for WCS base and mobile/portable stations:

---

8. There are instances where it is necessary to deploy transportable AMT receivers; however, these systems are still located in the vicinity of the test range and are used on a temporary basis.

9. AFTRCC is recognized by the FCC and the NTIA as the non-Federal coordinator for flight test frequencies in the 2360-2395 MHz band.

10. The emission suppression limits are specified in terms of average power. AFTRCC believes that the peak power levels of the WCS transmitter emissions are problematic. *See* filing on behalf of Aerospace and Flight Test radio Coordinating Council in WT Docket No. 07-293, IB Docket No.95-91, *Ex Parte* Comments (Aug. 14, 2009). This issue may have to be addressed as part of the coordination process if interference to AMT receivers occurs.

**Base Station**: the power of any emission shall be suppressed by a factor of not less than:
43 + 10 Log (P) in the 2300-2305 MHz band segment
70 + 10 Log (P) in the 2300-2287.5 MHz band segment
72 + 10 Log (P) in the 2287.5-2285 MHz band segment
75 + 10 Log (P) below 2285 MHz

**Mobile/Portable Station:** the power of any emission shall be suppressed by a factor of not less than:
43 + 10 Log (P) in the 2300-2305 MHz band segment
55 + 10 Log (P) in the 2296-2300 MHz band segment
61 + 10 Log (P) in the 2292-2296 MHz band segment
67 + 10 Log (P) in the 2288-2292 MHz band segment
70 + 10 Log (P) below 2288 MHz

P is total average power in Watts measured at the output of the transmitter.[11] The emission suppression levels are measured in a 1 MHz bandwidth.

In order to protect sensitive communications used to guide and control planetary and interplanetary spacecraft in deep space a coordination distance of 145 kilometers around the DSN site located in Goldstone CA (35-25-33 N 116-53-23 W) needs to be established for WCS base stations.

NTIA supports the FCC goal of making spectrum available for the deployment of wireless broadband services. Given the importance to national aerospace, defense industries and scientific research, NTIA believes that WCS licensees can take steps necessary to avoid causing interference to AMT and DSN receivers, while maximizing the use of the available spectrum. Enclosure 3 includes proposed modifications to the coordination requirements proposed in the Public Notice.

If you have any questions regarding these recommendations please feel free to contact me.

Sincerely,

Karl B. Nebbia
Associate Administrator
Office of Spectrum Management

Enclosures (3)

11. The averaging is performed only during periods of transmission.

**Enclosure 1**

U.S. Department
of Transportation
**Federal Aviation
Administration**

Technical Operations Services
800 Independence Avenue, SW.
Washington, DC 20591

DEC 16 2009

NOV 30 2009

The Honorable Lawrence E. Stickling
Assistant Secretary for Communications and Information
National Telecommunications and Information Administration
United States Department of Commerce
1401 Constitution Avenue, NW.
Washington, DC 20230

Dear Secretary Strickling:

This is to bring to your attention two proceedings pending before the Federal Communication Commission (FCC) that are of concern to the Federal Aviation Administration (FAA). The first considers an allocation in the 2360-2390 MHz band for medical telemetry devices (ET Docket No. 08-59). The second looks toward the adoption of rules for the Wireless Communications Service (WCS) (WT Docket No. 07-293 et al) in the band 2345-2360 MHz. Both proceedings raise the possibility of interference to sensitive telemetry gathered during flight testing of new and modified aircraft.

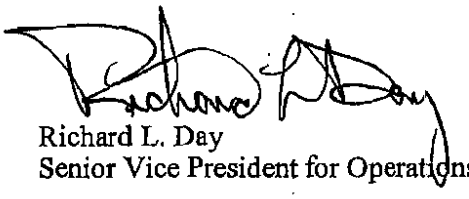
The 2360-2390 MHz band has long been allocated for flight test telemetry. It is shared co-equally by Government and Non-Government users, including the Department of Defense, the National Aeronautics and Space Administration, and aerospace manufacturers. While not directly operating systems in that band, the FAA requires that new and modified aircraft satisfy specific safety requirements before the aircraft may be placed into service. Among other things, manufacturers must obtain an airworthiness certificate, the issuance of which depends on a demonstration that the aircraft has been properly flight tested. Restrictions on test flight airspace are frequently required in order to respond to air traffic congestion and/or weather conditions complicating the ability of manufacturers to conduct flight tests on an efficient basis. The availability of real-time telemetry is integral to that testing process so any risk to the continued availability of flight telemetry spectrum resource on an interference-free basis must be curtailed to avoid further disruptions.

In both of the proceedings referenced above however, it appears the risk to the flight telemetry operations may not be being sufficiently addressed. In particular, regarding medical telemetry, the record developed to date indicates that operations of the proposed medical devices may cause interference to the sensitive telemetry receivers. In addition, the possibility of flight test telemetry transmissions causing interference to potentially life-critical patient data being transmitted by the medical devices does not appear to have been addressed. Though by regulation, the FCC proposal may be for operations on a no-interference/no-protection basis; if a problem does arise it will likely impact in some fashion the primary aeronautical telemetry applications. As a result, studies must conclusively demonstrate compatibility before medical telemetry is allowed in the band.

In the case of the Wireless Communication Service devices operating in the band adjacent to telemetry, we are concerned that sufficient limits be placed on out-of-band emissions to ensure compatibility.

In conclusion, we urge that steps be taken now to ensure full compatibility with aeronautical telemetry prior to any allocation for medical devices in 2360-2390 MHz band. Likewise, we would urge that means be adopted for protecting the aeronautical telemetry from emissions from WCS operating in the adjacent spectrum. While the rules are necessary to accomplish these protections within the province of the FCC, Executive Branch, views are highly relevant to such determinations. Accordingly, we ask that you convey these views to the FCC.

Sincerely,



Richard L. Day
Senior Vice President for Operations

**Enclosure 2**

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

NETWORKS AND
INFORMATION INTEGRATION

FEB 04 2010

The Honorable Lawrence E. Strickling
Assistant Secretary for Communications and Information
National Telecommunications and Information Administration
United States Department of Commerce
1401 Constitution Ave., NW
Washington, DC 20230

Dear Secretary Strickling:

The purpose of this letter is share some concerns regarding and request your assistance in resolving two upcoming Federal Communications Commission (FCC) rulemakings on the S-band (2360-2390 MHz). Decisions regarding these proceedings have the potential to negatively impact DoD acquisition program costs – and entail added safety risks – by allowing interference in the S-band that has long been restricted to flight testing.

The first proceeding involves proposals for changes in FCC Rules applicable to Wireless Communications Service (WCS) licensees. These entities operate in the band adjacent to flight test telemetry, namely 2345-2360 MHz. The second proceeding involves proposals for the allocation of S-band spectrum for a new wireless system referred to as Medical Body Area Network Service (MBANS).

The Department appreciates that WCS and MBANS can help meet pressing national concerns such as the spread of broadband Internet access and improved health care delivery. However, preserving interference-free flight test spectrum is critical to the development of new and improved aerospace systems for our military and, ultimately, supports national security.

This office requests an opportunity for DoD representatives to meet with your Agency to resolve concerns regarding technical measures to ensure compatibility of WCS and MBANS systems for proper protection of flight test operations. Since the FCC rule making process for WCS is understood to be at an advanced stage, such a meeting should be held, ideally within the next couple of weeks.

If the technical issues at hand cannot be resolved prior to the conclusion of the FCC rulemakings, request the NTIA oppose both proposals until such time the appropriate solutions are in place to ensure protection of flight test operations from potential interference from WCS and MBANS in the S-Band. This office looks forward to continuing the work with your staff on these important matters to continue to balance national security and economic interests. The point of contact for this action is Mr. Danny Price, 703-607-0269

Sincerely,

Cheryl J. Roby
Principal Deputy

cc:
Under Secretary of Defense for Acquisition,
Technology and Logistics
Director, Defense Spectrum Organization
Associate Administrator, Office of
Spectrum Management, NTIA

[redacted]

**Enclosure 3**

**Tracked Modifications to DA-10-592**
**§ 27.73 WCS and MAT Coordination Requirements**

**§ 27.73 WCS, ~~and MAT~~ AMT, and Goldstone coordination requirements.**

This section requires Wireless Communications Services (WCS) licensees in the 2345-2360 MHz band to coordinate the deployment of base stations with Aeronautical Mobile Telemetry (AMT) facilities in the 2360-2395 MHz band and the Deep Space Network earth station in Goldstone California; and to take all practicable steps necessary to minimize ~~reduce~~ the risk ~~likelihood~~ of harmful interference to these ~~AMT~~ facilities.~~:~~

(a) Wireless Communications Service (WCS) licensees operating base stations in the 2345-2360 MHz band shall, prior to operation of such base stations, achieve a mutually satisfactory coordination agreement with the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) ~~with any MAT entity operating an~~ for any AMT receiver facility within 45 kilometers or the radio line of sight~~e~~, whichever distance is larger, of the intended WCS base station location. This coordination is necessary to protect AMT receive systems consistent with Recommendation ITU-R M.1459. The locations of current and planned Federal and non-Federal AMT receiver sites may be obtained from AFTRCC. ~~the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) for non-federal MAT receivers~~ ~~. For federal MAT receivers, the WCS licensee shall supply sufficient information to the Commission to allow coordination to take place. A listing of current MAT receiver sites can be obtained from AFTRCC for non-federal sites and through the FCC's IRAC Liaison for federal MAT receiver sites.~~

(b) WCS licensees operating base stations in the 2305-2320 MHz band shall prior to operation of such base stations, achieve a mutually satisfactory coordination agreement with the National Aeronautics and Space Administration (NASA) within 145 kilometers of the Goldstone, CA earth station site (35-25-33 N 116-53-23 W).

(c) After base station operations commence, upon receipt of a complaint of harmful interference, the WCS licensee(s) receiving the complaint, no matter the distance from the NASA Goldstone, CA earth station or from an AMT site, operating in the 2305-2320 or 2345-2360 MHz bands, respectively, shall take all practicable steps to immediately eliminate the interference.

(~~b~~d) *Duty to Cooperate*. WCS licensees, ~~and~~ AFTRCC, and NASA ~~MAT receiver operators~~ must cooperate in good faith in the coordination and deployment of new ~~WCS and MAT~~ facilities. WCS licensees must also cooperate in good faith in the selection and use of new station sites and new frequencies ~~when within radio line of site of MAT receiver facilities~~ to reduce the risk ~~likelihood~~ of harmful interference and make the most effective use of the authorized facilities. Licensees of stations suffering or causing harmful interference must cooperate in good faith and resolve such problems by mutually satisfactory arrangements. If the licensees are unable to do so, the Wireless

Telecommunications Bureau, in consultation with the Office of Engineering and Technology and the National Telecommunications and Information Administration may impose restrictions including specifying the transmitter power, antenna height, or area or hours of operation of the stations.